



# **TRIAL REPORT**

**GERMANY 2023**

**Meat tenderisation  
with Denazyme NNC**

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<b>Project</b>	Cooked Ham / Pulled Pork without Collagenase					
<b>Project number:</b>						
<b>Date:</b>	08.06.2023					

<b>*Amount raw material (meat):</b>	10,00	kg				
<b>*Desired brine addition:</b>	15,00	%				
<b>Desired amount of brine:</b>	13,00	kg				
<b>desired drying:</b>	0,00	%				
<b>Pre run injector:</b>	0,00	kg				

**Total finished product before cooking:** 11,50 kg

Item number	description	% ready product	brine in %	added brine [kg]	brine incl. Pre run [kg]:	Desired amount of brine [kg]:
				1,500	1,500	13,000
	water/ ice	13,04%	81,6%	1,224	1,224	10,608
	NPS 0,6%	1,60%	12,3%	0,184	0,184	1,595
	Glucose syrup	0,30%	2,3%	0,035	0,035	0,299
	Diphosphate	0,35%	2,7%	0,040	0,040	0,349
	Dextrose	0,10%	0,8%	0,012	0,012	0,100
	Ascorbic acid	0,05%	0,4%	0,006	0,006	0,050
			0,0%	0,000	0,000	0,000
	<b>Total brine:</b>		100,0%	1,500	1,500	13,000

**Total amount on reduction of weight:** 11,50 kg

**Processing description:**

Prepare the brine with cold water until all the dry substances are dissolved, including the enzymes  
Inject brine into the pork topside (for cooked ham), pork neck (pulled pork)

Massage cured meat in tumbler for 3h at 12rpm under vacuum (90%) and cooling (4°C)  
Massage neck for pulled pork for only 30min at 12rpm under vacuum (90%) and cooling (4°C)  
Seal neck in vacuum bag and refrigerate overnight

Put cooked ham pieces into mould and vacuum pack. then secure with lid  
Leave cooked ham to rest in the refrigerator overnight

Cook ham mould in the chamber for 1hr at 45°C then cook at 76°C to core 72°C  
Leave cooked ham to cool in the refrigerator overnight

Shape and slice the cooked ham

Cool neck in bag for 1hr at 45°C then cook for 2,4,6h at 80°C

<b>Project</b>	Cooked Ham / Pulled Pork with Collagenase					
<b>Project number:</b>						
<b>Date:</b>	08.06.2023					
<b>*Amount raw material (meat):</b>	10,00	kg				
<b>*Desired brine addition:</b>	15,00	%				
<b>Desired amount of brine:</b>	13,00	kg				
<b>desired drying:</b>	0,00	%				
<b>Pre run injector:</b>	0,00	kg				
<b>Total finished product before cooking:</b>	11,50 kg					
<b>Item number</b>	<b>description</b>	<b>% ready product</b>	<b>brine in %</b>	<b>added brine [kg]</b>	<b>brine incl. Pre run [kg]:</b>	<b>Desired amount of brine [kg]:</b>
				1,500	1,500	13,000
	water/ ice	13,04%	77,8%	1,167	1,167	10,110
	NPS 0,6%	1,60%	12,3%	0,184	0,184	1,595
	Glucose syrup	0,30%	2,3%	0,035	0,035	0,299
	Diphosphate	0,35%	2,7%	0,040	0,040	0,349
	Dextrose	0,10%	0,8%	0,012	0,012	0,100
	Ascorbic acid	0,05%	0,4%	0,006	0,006	0,050
	Denazyme NNC	0,50%	3,8%	0,058	0,058	0,498
	<b>Total brine:</b>		100,0%	1,500	1,500	13,000
<b>Total amount on reduction of weight:</b>	11,50 kg					
<b>Processing description:</b>						
Prepare brine with cold water until all dry substances are dissolved, including the enzyme						
Inject brine into the pork topside (for cooked ham), pork neck (for pulled pork)						
Massage cured meat in a tumbler for 3 hrs at 12/rpm under vacuum (90%) and cooling (4°C)						
Massage neck for pulled pork for 30 mins at 12/rpm under vacuum (90%) and cooling (4°C)						
Seal neck in a vacuum bag and refrigerate overnight						
Put cooked ham pieces into mould and vacuum pack, then secure the lid						
Leave cooked ham to rest in the refrigerator overnight						
Cook ham mould in the chamber for 1h at 45°C then cook at 76°C to core 72°C						
Leave cooked ham to cool in the mould overnight in the refrigerator						
Shape and slice the cooked ham						
Cook neck in bag 1hr at 45°C then cook for 2,4,6h at 80°						

### **Cooked Ham**

#### **Weight losses after cooking process:**

- without Collagenase around 2 %
- with Collagenase around 7.5 %

<b>Project</b>	Raw Ham without Enzyme					
<b>Project number:</b>						
<b>Date:</b>	08.06.2023					
<b>*Amount raw material (meat):</b>	5,70	kg				
<b>*Desired brine addition:</b>	5,00	%				
<b>Desired amount of brine:</b>	13,00	kg				
<b>desired drying:</b>	0,00	%				
<b>Pre run injector:</b>	0,00	kg				
<b>Total finished product before cooking:</b>	5,99	kg				
<b>Item number</b>	<b>description</b>	<b>% ready product</b>	<b>brine in %</b>	<b>added brine [kg]</b>	<b>brine incl. Pre run [kg]:</b>	<b>Desired amount of brine [kg]:</b>
				0,285	0,285	13,000
	water/ ice	4,76%	73,3%	0,209	0,209	9,533
	Nitrite curing salt 0,9%	1,25%	26,3%	0,075	0,075	3,413
	Protective cultures	0,02%	0,4%	0,001	0,001	0,055
		0,00%	0,0%	0,000	0,000	0,000
		0,00%	0,0%	0,000	0,000	0,000
		0,00%	0,0%	0,000	0,000	0,000
			0,0%	0,000	0,000	0,000
	<b>Total brine:</b>		100,0%	0,285	0,285	13,000
<b>Total amount on reduction of weight:</b>		5,99	kg			
<b>Item number</b>	<b>Dry Products</b>	<b>Dosage in g/kg calculated on raw</b>				
	Nitrite curing salt 0,6%	12,5g/kg				
	Dextrose	2g/kg				
	Sodium ascorbate	0,3g/kg				
	Pepper extract "3-fa dh" (concentrate)	0,5g/kg				
	Ground white pepper	1g/kg				
<b>Processing description:</b>						
Prepare the brine with the cold water until all dry substances are dissolved						
Inject the brine into the pork rump and front shoulder						
massage the cured meat in the tumbler for 30min at 6rpm under vacuum (90%) and cooling (4°C)						
Add the dry ingredients to tumbler and massage again for 30min at 6rpm under vacuum (90%) and cooling (4°C)						
Press ham into shape, cover and place in cold storage for 2 weeks						
Mature and smoke ham in smoking chamber according to programme specifications						
After drying (min 25%), store ham in vacuum bag in cold storage for 2 weeks						
Slice the ham						

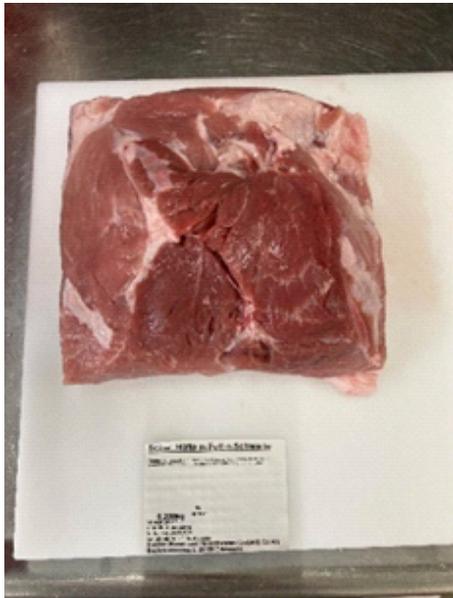
<b>Project</b>	Raw Ham with Enzyme					
<b>Project number:</b>						
<b>Date:</b>	08.06.2023					
<b>*Amount raw material (meat):</b>	5,81	kg				
<b>*Desired brine addition:</b>	5,00	%				
<b>Desired amount of brine:</b>	13,00	kg				
<b>desired drying:</b>	0,00	%				
<b>Pre run injector:</b>	0,00	kg				
<b>Total finished product before cooking:</b>	6,10	kg				
<b>Item number</b>	<b>description</b>	<b>% ready product</b>	<b>brine in %</b>	<b>added brine [kg]</b>	<b>brine incl. Pre run [kg]:</b>	<b>Desired amount of brine [kg]:</b>
				0,291	0,291	13,000
	water/ ice	4,76%	62,8%	0,183	0,183	8,168
	Nitrite curing salt 0,9%	1,25%	26,3%	0,076	0,076	3,413
	Protective cultures	0,02%	0,4%	0,001	0,001	0,055
	Denazyme NNC	0,50%	10,5%	0,031	0,031	1,365
		0,00%	0,0%	0,000	0,000	0,000
		0,00%	0,0%	0,000	0,000	0,000
			0,0%	0,000	0,000	0,000
	<b>Total brine:</b>		100,0%	0,291	0,291	13,000
<b>Total amount on reduction of weight:</b>	6,10 kg					
<b>Item number</b>	<b>Dry Products</b>	<b>Dosage in g/kg calculated on raw</b>				
	Nitrite curing salt 0,6%	12,5g/kg				
	Dextrose	2g/kg				
	Sodium ascorbate	0,3g/kg				
	Pepper extract "3-fach" (concentrate)	0,5g/kg				
	Ground white pepper	1g/kg				
<b>Processing description:</b>						
Prepare brine with cold water until all dry substances are dissolved, including the enzymes						
Inject the brine into the pork rump and the front shoulder						
Massage the cured meat in the tumbler for 30min at 6rpm under vacuum (90%) and cooling (4°C)						
Add dry ingredients to tumbler and massage again for 30min at 6rpm under vacuum (90%) and cooling (4°C)						
Press ham into shape, cover and place in cold storage for 2 weeks						
Mature and smoke ham in smoking chamber according to programme specifications						
After drying (min 25%), place ham in vacuum bag in cold storage for 2 weeks						
Slice the ham						

**Process Raw Ham:**

1. Prepare the brine with the cold water until all dry substances are dissolved



2. Inject the brine into the pork rump and the front end of the shoulder, with an injection rate of 5 %





3. Massage the cured meat in the tumbler for 30 min at 6 rpm under vacuum (90 %) and cooling (4 °C). Add dry ingredients to tumbler and massage again for 30 min at 6 rpm under vacuum (90 %) and cooling (4 °C).



4. Press ham into shape, cover and place in cold storage for 2 weeks by 6 °C.



5. Mature and smoke ham in smoking chamber according to programme specifications:
- 45 °C, 98 % relative humidity, 48 h
  - 25 °C, 80 % relative humidity, 24 h
  - Smoking 1 h
  - 18 °C, 65 % relative humidity till 30 % weight loss

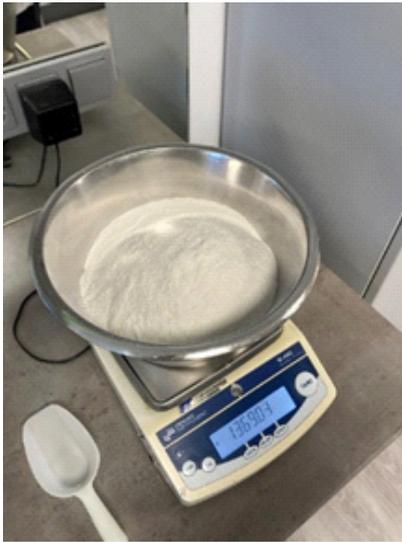


6. After drying (min. 25 %), place ham in vacuum bag in cold storage for 2 weeks.



**Process cooked Ham / pulled Pork:**

1. Prepare the brine with the cold water until all dry substances are dissolved, including the enzymes.



2. Inject brine into the pork topside (for cooked ham), pork neck (pulled pork).



3. Massage cured meat in tumbler for 3 h at 12 rpm under vacuum (90 %) and cooling (4 °C).

Massage neck for pulled pork for only 30 min at 12 rpm under vacuum (90 %) and cooling (4 °C).



4. Seal neck in vacuum bag and refrigerate overnight. Leave cooked ham to rest in the refrigerator overnight.
5. Cook ham mould in the chamber for 1 h at 45 °C then cook at 76 °C to core 72 °C.  
Cook neck in bag for 1 h at 45 °C then cook for 2, 4, 6 h at 80 °C.

### Products

